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TITLE: PRESSURE-SENSITIVE ADHESIVE COMPOSITION HAVING EXCELLENT INKJET INK
FIXABILITY AND SHEET USING THE SAME USED FOR CARRYING INFORMATIONAbstract Text (1):

PROBLEM TO BE SOLVED: To provide a pressure-sensitive composition which has the excellent fixability of an inkjet ink, is used for imparting water resistance to a sheet for carrying information, does not cause the ink offset phenomenon of the inkjet ink containing a pigment as a main component, and does not cause problems such as a problem that a cationic resin is eluted to stain a printing plate, when a wet offset printing is carried out, and to provide a sheet which has the adhesive layer of the pressure-sensitive adhesive composition, has the excellent fixability and water resistance of the inkjet ink, and is used for carrying information.

Abstract Text (2):

SOLUTION: This pressure-sensitive adhesive composition is characterized by compounding 100 pts.wt. (solid content) of a styrene methyl methacrylate graft copolymer natural rubber-based adhesive base agent with 5 to 25 pts.wt. of colloid fine particles, such as silica or calcium carbonate, having an average particle diameter of 1 to 100 nm.

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CLAIMS

[Claim(s)]

[Claim 1] By being applied to the superposition side of a sheet, forming the glue line which is not pasted up by the normal state by desiccation processing, making said superposition sides opposite-**, and giving a predetermined pressure Are the pressure sensitive adhesive constituent on which the superposition sides are pasted up possible [exfoliation], and the styrene-methyl-methacrylate graft copolymerization natural-rubber-adhesives basis (solid content) 100 mass section is received. The pressure sensitive adhesive constituent excellent in fixable [of the ink jet ink characterized by blending the colloid particle 5 with a mean particle diameter of 1-100nm - 25 mass sections].

[Claim 2] The pressure sensitive adhesive constituent according to claim 1 characterized by said colloid particles being a silica and/or a calcium carbonate.

[Claim 3] The sheet for information support which comes to have the glue line of claim 1 or a pressure sensitive adhesive constituent according to claim 2 in the predetermined section of the superposition side of a base sheet.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the sheet for information support using a pressure sensitive adhesive constituent and it excellent in fixable [of ink jet ink]. In more detail The folding sheet which becomes considering the field piled up by folding or the end pile as an information support side, It is related with the pressure sensitive adhesive constituent excellent in fixable [of sheets for signal transduction, such as sheets for office work, such as a sheet for signal transduction which has confidential nature like a superposition sheet, an arrangement sheet in which dimension expansion is possible, and a copying paper, and the ink jet ink used for this].

[0002]

[Description of the Prior Art] Conventionally, when it piles up, it is the pattern which opposite-**, and the glue line of a pressure sensitive adhesive is usually prepared in the whole surface of the superposition side of a base sheet, the particular part, or the line so that the superposition sides may paste up in the sheet for information support which supports information to a superposition side. By also being called a self-adhesive property pressure sensitive adhesive, and applying pressure in the condition of having made those glue lines opposite-**(ing), this pressure sensitive adhesive is a type thing which a mutual macromolecule sticks by the self-diffusion, and embodies a permanent adhesive property and a re-exfoliation adhesive property with the class of constituent, or extent of pressurization.

[0003] Recently, it considers as the approach of carrying out adjustable printing of the individual information etc., and an ink jet recording method is spreading quickly at the address, a name, and it. Color printing (process color) which is equal also to the conventional platemaking technique especially by the spread of colorization of ink is also attained.

[0004]

[Problem(s) to be Solved by the Invention] However, the conventional pressure sensitive adhesive had the problem (ink offset) on which the ink jet ink which printed the sheet for information support to which pressure was applied, and which was pasted up in the condition of having made the glue lines which are not printing the glue line which printed ink jet ink, and ink jet ink opposite-**(ing) after printing ink with an ink jet printer on a glue line when it re-exfoliated shifts to the glue line side which is not printing ink jet ink. then , in order to make it an ink offset phenomenon not happen , while blend the microparticulate bulking agents (wheat starch with a particle size of 1 micrometer - about 20 micrometers etc.) in which undissolved be show to an adhesives basis , the sheet for information support for ink jet record which carried out specified quantity combination of the cationic matter be propose -- **** (JP,11-48651,A) -- the top where effectiveness be inadequate , at the time of wet offset printing , cation resin be eluted and there be problems , such as raise the printing version dirt . Furthermore, instead of printing in the ink jet ink which used the water soluble dye inferior to a water resisting property as the principal component, in order to give a water resisting property to the sheet for information support, even if it used the ink jet ink which used the pigment excellent in the water resisting property as the principal component, this ink offset phenomenon had appeared strongly.

[0005] The 1st purpose of this invention is offer of the pressure sensitive adhesive constituent excellent in fixable [of ink jet ink]. The ink offset phenomenon of the ink jet ink which uses a pigment as a principal component used in order to give a water resisting property especially to the sheet for information support is not produced. It is offering a pressure sensitive adhesive constituent without problems, such as cation resin's being eluted and raising the printing version dirt at the time of wet offset printing. Further moreover, the 2nd purpose of this invention It is offering the sheet for information support excellent in fixable and the water resisting property of ink jet ink using such a pressure sensitive adhesive constituent.

[0006]

[Means for Solving the Problem] It came to complete a header and this invention for the ability of the pressure sensitive adhesive constituent which could solve the conventional problem and was excellent in fixable [of ink jet ink], and the sheet for information support which was excellent in fixable and the water resisting property of ink jet ink by using it to be offered by carrying out the amount combination of specification of the colloid particle which has specific mean particle diameter in a specific natural-rubber-adhesies basis, as a result of repeating research wholeheartedly that this invention person should solve said technical problem.

[0007] Namely, the pressure sensitive adhesive constituent excellent in fixable [of the ink jet ink of this invention according to claim 1] By being applied to the superposition side of a sheet, forming the glue line which is not pasted up by the normal state by desiccation processing, making said superposition sides opposite-**, and giving a predetermined pressure Are the pressure sensitive adhesive constituent on which the superposition sides are pasted up possible [exfoliation], and the styrene-methyl-methacrylate graft copolymerization natural-rubber-adhesies basis (solid content) 100 mass section is received. It is characterized by blending the colloid particle 5 with a mean particle diameter of 1-100nm - 25 mass sections.

[0008] The pressure sensitive adhesive constituent excellent in fixable [of the ink jet ink of this invention according to claim 2] is characterized by said colloid particles being a silica and/or a calcium carbonate.

[0009] The sheet for information support of this invention according to claim 3 is characterized by coming to have the glue line of claim 1 or a pressure sensitive adhesive constituent according to claim 2 in the predetermined section of the superposition side of a base sheet.

[0010] It is not necessary to use the cation resin used in order to raise fixable [of water soluble dye], and since fixable [of the ink JIETO ink which used the pigment as the principal component] improves, especially in the pressure sensitive adhesive constituent of this invention, like before, cation resin is eluted at the time of wet offset printing, and problems, such as raising the printing version dirt, are lost. And fixable [of the printed ink jet ink] is improved, ink offset will not take place, and even if it puts at the time of preservation etc., it does not produce blocking further, either, while the water resisting property of the sheet [for information support] using the pressure sensitive adhesive constituent of this invention improves.

[0011]

[Embodiment of the Invention] The natural rubber latex which was points, such as a water resisting property, blocking resistance, thermal resistance, and abrasion resistance, was made to carry out the graft copolymerization of a methyl methacrylate and the styrene to especially natural rubber, and was especially obtained also in the latex which uses natural rubber as a principal component as a natural-rubber-adhesies basis used in the pressure sensitive adhesive constituent of this invention and the thing which denaturalized it, for example, an acid latex, a depolymerization latex, vulcanized latex, or the graft-ized natural rubber latex is used preferably. The natural rubber latex which was made to carry out the graft copolymerization of a methyl methacrylate and the styrene to the natural rubber preferably used in the pressure sensitive adhesive constituent of this invention, and was obtained carries out the graft copolymerization of a methyl methacrylate 10 40 mass sections extent styrene 1 - 10 mass sections extent as opposed to the natural rubber 100 mass section.

[0012] In the pressure sensitive adhesive constituent of this invention, it is required to blend a colloid

particle with a mean particle diameter of 1-100nm with a natural-rubber-adhesives basis not using cation resin. There is a possibility that blocking resistance may not be improved for the mean particle diameter of a colloid particle by less than 1nm, and if it exceeds 100nm conversely, there is a possibility that ink offset may not be improved. It is thought that adsorbent [of ink jet ink] becomes good about a colloid particle with a mean particle diameter of 1-100nm while blocking resistance is improved to the styrene-methyl-methacrylate graft copolymerization natural-rubber-adhesives basis (solid content) 100 mass section 5 - 25 mass section and by carrying out 10-20 mass section combination preferably, and ink offset is improved.

[0013] Since the probability for ink jet ink to be attached to a colloid particle will become high if there is a possibility that a machining property may get worse when blocking resistance is not improved for the loadings of a colloid particle under in 5 mass sections, and 25 mass sections are exceeded conversely, there is a possibility that an ink offset phenomenon may happen.

[0014] Although especially the colloid particle used in this invention is not limited, specifically For example, a silica, precipitated calcium carbonate, whiting, a kaolin, Talc, a calcium sulfate, a barium sulfate, a titanium dioxide, a zinc oxide, Zinc sulfide, zinc carbonate, a satin white, aluminum silicate, the diatom earth, A calcium silicate, a magnesium silicate, synthetic amorphous silica, pseudo-boehmite, An aluminum hydroxide, an alumina, a lithopone, a zeolite, hydrated halloysite, Inorganic colloid particles, such as a magnesium carbonate and a magnesium hydroxide, Organic colloid particles, such as a styrene system plastics pigment, an acrylic plastics pigment, polyethylene, a microcapsule, a urea-resin, melamine resin, and wheat flour starch, etc. can be mentioned. These colloid particles may be used independently, and two or more sorts may be combined and they may be used.

[0015] Also in these colloid particles, a top effective in an improvement of blocking resistance and ink offset, the silica and the calcium carbonate are easy also for acquisition, and can be preferably used in this invention.

[0016] In this invention, other particle bulking agents can be blended in addition to a colloid particle. This has the small solubility over a natural-rubber-adhesives basis, and it is desirable to use a particle bulking agent with the water resisting property in which particle shape was regularly ready.

[0017] As other particle bulking agents, various starch system particles with a particle size of 1 micrometer - about 20 micrometers, silica gel, fine spherical acrylic resin, fine spherical methacrylic resin, fine spherical polyethylene, glass powder, milt balun, natural zeolite, permutite, a calcium carbonate, the activated clay, etc. are mentioned, for example. These particle bulking agents may be used independently, and two or more sorts may be combined and they may be used.

[0018] In the natural-rubber-adhesives basis used in pressure sensitive adhesive ***** from a book, the additive commonly used by adhesives according to the request, for example, a tackifier, a viscosity controlling agent, an antioxidant, a stabilizer, a coloring agent, etc. can be added.

[0019] The pressure sensitive adhesive constituent of this invention can be used suitable for the postcard which has the spread side which can exfoliate easily if needed, various documents, a notice, various cards, etc., although it is applied to a base sheet surface by spreading means, such as a gravure coating machine, flexo one, an air knife coating machine, and a bar coating machine, and pastes up temporarily in the form of various kinds of superposition, such as superposition of double fold, three fold, an end pile, or another objects.

[0020] Next, as a base sheet with which the adhesives constituent of this invention is applied, synthetic films other than the usual paper, such as a synthetic paper or polyethylene, polyethylene terephthalate, polypropylene, and a vinyl chloride, can also be used. When using these synthetic films, it is desirable to perform surface treatment, such as mat processing and corona treatment, for the front face of a base sheet. moreover, the coverage of the adhesives constituent to a base sheet surface -- a maintenance of the adhesive property of a glue line, detachability, or transparency sake -- 1 - 30 g/m² -- desirable -- 3 - 20 g/m² -- further -- desirable -- 5-15g/m² ** -- it is good to carry out. It is the formed glue line which can be exfoliated with a pressurization roller further again About 1-10kg/cm² By pressurizing, blocking resistance can be improved further.

[0021] In order to give a water resisting property to the sheet for information support using this pressure

sensitive adhesive constituent as ink jet ink which can be used in this invention, the ink jet ink which uses a pigment as a principal component may be desirable, and may contain pH regulator, a viscosity controlling agent, a surface tension regulator, etc.

[0022] Next, the configuration of the sheet for information support of this invention is explained to a detail based on an accompanying drawing. The surface development view of the three fold postcard of this invention and drawing 2 drawing 1 here The rear-face development view of this postcard, The condition explanatory view at the time of drawing 3 inserting in X-X-ray sectional view of drawing 1 , and drawing 4 inserting in the postcard of drawing 1 , The surface development view of the double fold postcard of this invention and drawing 6 drawing 5 The rear-face development view of this postcard, The condition explanatory view at the time of drawing 7 inserting in the postcard of drawing 5 and drawing 8 are the condition explanatory views at the time of the surface development view of the partial double fold postcard of this invention and drawing 9 inserting in the rear-face development view of this postcard, and drawing 10 inserting in the postcard of drawing 8 .

[0023] First, the three fold postcard 1 shown in drawing 1 thru/or drawing 3 consists of base sheets 2 which have size 3 times the size of a fixed form postcard, and is divided to three fields by bend lines 3a and 3b. In the front rear face of the central partition field B, and the front face of the right-hand side partition field C, the concealment information printing 5 is directly printed for the destination information printing 4 of a zip code, an addressing name, the address, etc. by the base sheet 2 again at the front face of the left-hand side partition field A. Furthermore, to this whole whole front face of the partition fields B and C of the base sheet 2 and whole rear face of the partition fields A and B that were printed, the pressure sensitive adhesive constituent of this invention is applied, and the glue line 6 which can exfoliate is formed. Thus, as shown in drawing 4 , that glue line 6 activates and pastes up the constituted three fold postcard 1 by inserting the superposition side of each partition into Z mold with bend lines 3a and 3b, making glue lines opposite-**, and pressurizing with a dry sealer in this condition.

[0024] Next, the double fold postcard 11 shown in drawing 5 and drawing 6 consists of base sheets 2 which have size twice the size of a fixed form postcard, and is divided to two fields D and E by the bend line 3 of a center section. In the rear face of the partition fields D and E, the concealment information printing 5 is directly printed for the destination information printing 4 of a zip code, an addressing name, the address, etc. by the base sheet 2 again at the front face of the left-hand side partition field D. Furthermore, to the whole rear face of the partition fields D and E of this printed base sheet 2, the pressure sensitive adhesive constituent of this invention is applied, and the glue line 6 which can exfoliate is formed. Thus, as shown in drawing 7 , the glue line 6 activates and pastes up the constituted double fold postcard 11 by inserting in and pressurizing with a bend line 3 like the above-mentioned three fold postcard, so that the glue lines on the rear face of a right-and-left partition may opposite-**.

[0025] Moreover, the partial double fold postcard 21 shown in drawing 8 and drawing 9 consists of base sheets 2 which have size 1.5 times the size of a fixed form postcard, and is divided to the fields F and G of two right and left to which size changes with bend lines 3. In the rear face of the right-hand side partition field G, the concealment information printing 5 is directly printed for the destination information printing 4 of a zip code, an addressing name, the address, etc. by the base sheet 2 again at the front face of the left-hand side partition field F. furthermore, a part of partition field F piled up when the whole rear face of the partition field G of this printed base sheet 2 and the partition field G are inserted in with a bend line 3 -- to the rear face, the pressure sensitive adhesive constituent of this invention is applied, and the glue line 6 which can exfoliate is formed. Thus, as shown in drawing 10 , the glue line 6 activates and pastes up the constituted partial double fold postcard 21 by inserting in and pressurizing with a bend line 3 like the above-mentioned double fold postcard, so that the glue lines on the rear face of a right-and-left partition may opposite-**.

[0026] Moreover, since the glue line which is formed with this invention constituent and which can be exfoliated also has the receptiveness of printing ink and a toner in itself, it can print additional information (not shown) on the front face with a usual airline printer or a usual non-impact printer further if needed.

[0027]

[Example] Although an example explains this invention in more detail below, this invention is not restrained at all by these examples.

(Example 1) The mixture which carried out terpene resin 5 mass section combination as a thickening grant agent to the styrene-MMA copolymerization natural rubber emulsion 100 mass section (solid content) which mixed and carried out the graft copolymerization of the styrene 2 mass section and the methyl-methacrylate (MMA) 10 mass section, and obtained them to the natural rubber 100 mass section as a natural-rubber-adhesives basis was used. The amyllum-tritici 40 mass section with a mean particle diameter of 15 micrometers and the colloidal-silica (Nissan chemistry company make trade name: Snow tex 20) 20 mass section could be added to this natural-rubber-adhesives basis 100 mass section (solid content), it stirred, and the pressure sensitive adhesive constituent of this invention was prepared.

[0028] It is the pressure sensitive adhesive constituent of this this invention at an air knife coating machine to the paper of fine quality (base sheet) of 70kg of ream weights 6g/m² Coating was carried out at a rate, the glue line was formed, subsequently, for 120 degrees C and 30 seconds, heating was performed and desiccation processing was carried out. Thus, with the ink jet printer made from SAITEKKUSU, after printing (black pigment ink), it dries to the glue line of the made sheet for information support, the following approach estimates 180-degree exfoliation (T mold exfoliation) adhesive strength, blocking resistance, and ink offset to it, and an evaluation result is shown in Table 1 at it.

[0029] The measuring method of 180° exfoliation (T mold exfoliation) adhesive strength : (1) The obtained sheet for information support Judge in width of face of 25mm, and die length of 100mm, and create a sample, and perform these two samples by die length of 25mm, and superposition and a sealing machine (the Toppan Forms PURESSERU multi) perform sealing processing. According to the peel adhesion test method JISK6854 of adhesives, 180-degree exfoliation (T mold exfoliation) adhesive strength is measured using an autograph AGS50 (Shimadzu make).

[0030] (2) Blocking resistance : double the glue line sides of a test sample (sheet for information support), and it is 500 g/cm². The pressure was applied and peel strength was measured after neglect for 30 minutes at 50 degrees C. The tension tester autograph AGS50 mold by Shimadzu Corp. was used for measurement of peel strength.

O : A, O:good, **:good, and x:improper blocking resistance (peel strength) (g/cm) made [5.0 or less thing / the thing of O and the range of 5.1-8.0] ** and 10.1 or more things x for the thing of O and the range of 8.1-10.0.

[0031] (3) Ink offset : the printing side was carried out inside and it was made 2 chip boxes, and after carrying out sticking-by-pressure unification, it re-exfoliated and judged by viewing whether ink would have offset to the opposite side. Printing was imprinting that in which O and an offset phenomenon have hardly occurred that in which the form of printing remains just and the offset phenomenon has not occurred at all for a while to the adhesives constituent side opposite to O and the printed field, printing was imprinting that in which the offset phenomenon has occurred a little to the adhesives constituent side opposite to ** and the printed field, and that in which the offset phenomenon has occurred clearly was judged to be x.

[0032] (Example 2) The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1 except having carried out 5 mass sections combination of the colloidal silica, and having prepared the pressure sensitive adhesive constituent of this invention.

[0033] (Example 3) The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1 except having carried out 5 mass sections combination of 20 mass sections and the colloidal silica for amyllum tritici, and having prepared the pressure sensitive adhesive constituent of this invention.

[0034] (Example 4) The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1 except having changed the colloidal silica to (the Nissan chemistry company make and the trade name:Snow tex S), and having prepared the

pressure sensitive adhesive constituent of this invention.

[0035] (Example 5) The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1 except having carried out 25 mass sections combination of the 100 mass sections and the colloidal silica for amyllum tritici, and having prepared the pressure sensitive adhesive constituent of this invention.

[0036] (Example 6) a colloidal silica -- (-- the result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1 except having changed to product [made from CABOT], and trade name:KYABO sparse S109), and having prepared the pressure sensitive adhesive constituent of this invention.

[0037] (Example 7) The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1 except having changed to the colloidal silica (the product made from CABOT, a trade name: KYABO sparse S109), having carried out 15 mass sections combination of it, and having prepared the pressure sensitive adhesive constituent of this invention.

[0038] (Example 1 of a comparison) It could change to the colloidal silica to the natural-rubber-adhesives basis 100 mass section (solid content) of example 1 publication with the amyllum-tritici 40 mass section with a mean particle diameter of 15 micrometers, the silica particle (Mizusawa chemistry company make, trade name:Mizukasil P-526) 40 mass section could be added, it stirred, and the comparative pressure sensitive adhesive constituent was prepared. The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1.

[0039] (Example 2 of a comparison) The comparative pressure sensitive adhesive constituent was prepared like the example 1 of a comparison except having added the silica particle (Mizusawa chemistry company make, trade name:Mizukasil P-526) 20 mass section. The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1.

[0040] (Example 3 of a comparison) The comparative pressure sensitive adhesive constituent was prepared like the example 1 of a comparison except having changed to the silica particle (the Mizusawa chemistry company make, trade name:Mizukasil P-526), and having made it the silica particle (Japanese silica company make, a trade name: E200). The result of having evaluated 180-degree exfoliation adhesive strength, blocking resistance, and ink offset like the example 1 is shown in Table 1.

[0041]

[Table 1]

	評価結果		
	オフセット	ブロッキング性	180° 剥離接着力
実施例 1	○	◎	50 (N/m)
実施例 2	◎	◎	55 (N/m)
実施例 3	◎	○	60 (N/m)
実施例 4	○	◎	50 (N/m)
実施例 5	○	◎	40 (N/m)
実施例 6	○	○	50 (N/m)
実施例 7	◎	○	53 (N/m)
比較例 1	×	◎	40 (N/m)
比較例 2	×	○	47 (N/m)
比較例 3	×	○	42 (N/m)

[0042] Table 1 shows that excel in 180-degree exfoliation adhesive strength, blocking resistance, and ink offset, and an offset phenomenon does not happen, while the pressure sensitive adhesive constituent of this invention of examples 1-7 is excellent in the printability. To it, although the pressure sensitive

adhesive constituent for the comparison of the example 1-3 of a comparison of 180-degree exfoliation adhesive strength and blocking resistance is good, it turns out that an offset phenomenon happens.

[0043]

[Effect of the Invention] The pressure sensitive adhesive constituent of this invention according to claim 1 is excellent in fixable [of ink jet ink] and blocking resistance which were printed, and printing oozes neither by rain nor the sweat of a hand, and it does so the remarkable effectiveness that an ink offset phenomenon does not happen while cation resin is eluted, and there are no problems, such as raising the printing version dirt, at the time of wet offset printing and excelling in the printability, in order not to use cation resin.

[0044] The sheet for information support of this invention according to claim 2 It is obtained economically advantageous with a low manufacturing cost, and can record by the ink jet recording method. The information concealed inside by exfoliating the interface can be seen. And there is no possibility that blocking may arise by the pile in the time of preservation of a sheet etc. When it excels in fixable [of the printed ink jet ink] and an interface is exfoliated, the information recorded on the pressure sensitive adhesive constituent side ** remarkable effectiveness that the offset phenomenon imprinted to an opposite adhesion side does not happen.

[Translation done.]